

Optical Fiber End Cap

SM, PM, MM



DATASHEET

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Features

- High Power
- High Efficiency
- Low Reflection
- Low Distortion
- Low Cost

Applications

- Fiber Lasers
- Fiber Collimator
- Optical System
- Sensor



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The fiber end cap increases the beam size as the laser exits the fiber end. It reduces the power density at the interface between fiber and air offering much higher transmitted power from fiber cores in a miniature format. Based on Agiltron's beam shaping technology, a high-quality end cap is uniquely formed directly at the fiber tip that transmits uniformly beam spot. We use both fusion splicing and thermal expansion to produce end cap optimized for various applications. Polarization maintains fiber end cap is our specialty.

The end cap diameter coreless rod selection is to maximize the out beam diameter. The length selection of the end cap is sufficiently shorter to avoid beam distortion from the edge. Various packaging formats are available: bare fiber with end cap; polyimide coating for autoclave, inside a protective tube, or inside a standard fiber connector for ease of attaching to a telescope.

The end-cap material is pure quartz

Specifications

Parameter	Min	Typical	Max	Unit
Insertion Loss ^[1]		< 0.2		dB
Operation Wavelength	400		2500	nm
End Cap Diameter		125, 250, 400, 1000		μm
End Cap Length	300		5000	μm
Face Angle		0, 8, 12		Deg
End Surface Back Reflection		> 50 (with AR coating)		dB
Polarization Extinct Ratio (PER)		> 19 (only for PM fiber)		dB
Beam Ellipticity		> 95 (only for single mode fiber)		%
Beam		1.5		M ²
Power Handling (W)		5, 10, 30, 50, 100, and 500		W
End Cap Diameter ()		0.125, 0.25		mm
Operating Temperature	0		75	°C
Store Temperature	-40		85	°C

Note:

[1]. Excluding connectors

P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

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Mechanical Dimensions (mm)

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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Ordering Information (Part Number)

Prefix	Wavelength	Optical Power	Face Angle Coating	Package	Fiber Type	Cable Type	Fiber Length	Connector ^[1]	PER
FECA-	1060 = 1 2000 = 2 1310 = 3 1480 = 4 1550 = 5 1625 = 6 780 = 7 850 = 8 980 = 9 460 = E 530 = F 630 = G 360 = H Special = 0	1W = 01 5W = 05 10W = 10 15W = 15 30W = 30 40W = 40 50W = 50 100W = AA 200W = BB 500W = CC	0° no coating = 1 0° with coating = 2 8° no coating = 3 8° with coating = 4 12° no coating = 5 12° with coating = 6 Special = 0	Bare fiber = 1 Inside FC/PC connector = 4 Inside 1.8mm OD tube = 5 Special = 0	<i>Select from below table</i>	Bare fiber = 1 0.9 mm loos tube = 9 2 mm PVC cable = 2 3 mm PVC cable = 3 3 mm amor cable = 4 5 mm amor cable = 5 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 2.0 = 4 5 m = 5 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0	N/A = 1 >18 dB = R >25 dB = H

[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

Fiber Type Selection Table:

01	SMF-28	34	PM1550	71	GIF 50/125um
02	SMF-28e	35	PM1950	72	GIF 62.5
03	Corning XB	36	PM1310	73	105/125um
04	SM450	37	PM405	74	FG105LCA
05	SM1950	38	PM480	75	FG50LGA
06	SM600	39	PM630	76	STP 50/125
07	Hi780	40	PM850	77	
08	SM800	41	PM980	78	
09	Hi980	42	PM780	79	
10	Hi1060	43	PM350	80	
11	SM300	44	PM2000	81	
12	SM400	45	PM460	82	
13	1060-25/250, DCF	46	1060-30/250, DCF	83	1060-20/400, 0.46NA DCF
14	1060-6/125, 0.46NA	47	1060-7/125, 0.46NA	84	1060-10/125, 0.46NA
15	1060-15/125, 0.46NA	48	1060-20/125, 0.46NA	85	1060-25/125, 0.46NA
16	1060-20/200, 0.46NA	49	1060-25/250, 0.46NA	86	1060-9/125, 0.46NA
17	PM1060-6/125, DCF	50	PM1060-10/125, DCF	87	PM1060-12/125, DCF
18	PM1060-25/250, DCF	51	PM1060-20/250, SCF	88	

Warning: An Optical Collimator need to have a working distance stated by the customer at the time of order

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Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters ($<5\text{ }\mu\text{m}$) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

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